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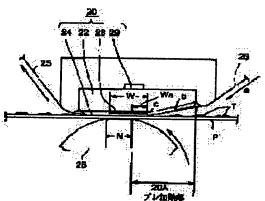
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#### (54) HEATING DEVICE AND IMAGE FORMING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To prevent image scattering when a material to be heated is forced into a heating nip portion by passing the material to be heated through a preheating portion for preheating before it is forced into the heating nip portion.

SOLUTION: In a film heating type thermal image fixing device, a heater 20 has an inflection point (c) upstream of a fixing nip portion B, and the side of the heater 20 opposite to a storage medium P has a slope that gets farther from the fixing nip portion N as it goes upstream from the inflection point (c). A film 25 to be fixed makes sliding movement as it approaches or comes into contact with the slope. The outwardly projected portion 20A of the heater 20 serves as a preheating portion for the storage medium P. The jutting portion Wa of a heating element 23 imparts thermal energy to the storage medium P before the medium is forced into the fixing nip portion B, thereby heating the outwardly extended portion 20A of the heater which serves as the



preheating portion. At the preheating portion the storage medium P is dried and its toner is increased in viscosity, so that even if heat is applied immediately before the fixing nip portion B, explosive formation of steam is avoided to prevent scattering of unfixed toner images.

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#### **CLAIMS**

#### [Claim(s)]

[Claim 1] Make a film insert between heating objects and pressurization members by which fixed support was carried out, and the heating nip section is made to form in it. It is the heating apparatus which introduces heated material between a film of this heating nip section, and a pressurization member, is made to carry out pinching conveyance of the heating nip section together with a film, and heat—treats heated material. A portion which a heating object is equipped with a heating element prolonged in the direction of a right angle in the conveyance direction of a film and heated material in the heating nip section, and this heating element has in a heating nip section field, It has a portion in a heating nip outside by the side of heated material carrying in of the heating nip section. As for a heating object, an opposed face with heated material has a folding point in a film and the heated material conveyance direction upstream rather than the heating nip section. a slant face which goes to a film and the heated material conveyance direction upstream from the folding point and where it is alike, and it follows and an opposed face with heated material of a heating object keeps away from a heating nip section horizontal line — \*\*\*\* — heating apparatus characterized by carrying out sliding migration while it gets down and a film approaches or contacts the slant face.

[Claim 2] It is calorific value of a portion which is in a heating nip outside of Q1 and this heating element about gross calorific value of a heating element Q2 Heating apparatus according to claim 1 characterized by making it set to 0.1<Q2/Q1 <0.4 when it carries out.

[Claim 3] A heating object is heating apparatus according to claim 1 or 2 characterized by having exoergic distribution to which calorific value becomes large toward the downstream from a film and the heated material conveyance direction upstream.

[Claim 4] Heating apparatus of any one publication of claim 1 characterized by arranging a heating element including a folding point of a heating object thru/or claim 3.

[Claim 5] Heating apparatus of any one publication of claim 1 characterized by being the record medium which supported an image with which heated material should be established, and equipment being a heating anchorage device which makes this record medium carry out heat fixing of the image thru/or claim 4.

[Claim 6] Image formation equipment which has an image formation means to form a non-established image in a record medium, and a heating fixing means to make a record medium carry out heat fixing of the non-established image, and is characterized by this heating fixing means being the heating apparatus of any one publication of claim 1 thru/or claim 4.

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#### DETAILED DESCRIPTION

### [Detailed Description of the Invention] [0001]

[The technical field to which invention belongs] This invention makes a film insert between the heating objects and the pressurization members by which fixed support was carried out, and makes the heating nip section form in it, and the heating apparatus and this heating apparatus of the film heating method which introduces heated material between the film of this heating nip section and a pressurization member, is made to carry out pinching conveyance of the heating nip section together with a film, and heat—treats in heated material are related in it to the image—formation equipment had as a heating anchorage device of an image.

[0002]

[Description of the Prior Art] The heating apparatus of the above film heating methods is indicated by JP,63-31318,A etc. In image formation equipments, such as – laser beam printer facsimile microfilm reader printer, image display (display) equipment, and a record machine, for example, a copying machine — With proper image formation process means, such as electrophotography, electrostatic recording, and magnetic recording The toner image which is not established corresponding to the image information of the purpose formed in the field of record media (an imprint material sheet electrofax sheet, an electrostatic recording sheet, printing paper, etc.) by the indirect (imprint) method or the direct method using the toner which consists of resin of heating melting nature etc. is used as a permanent fixing image. It is utilizable as an image anchorage device which carries out heating fixing processing.

[0003] In, contrast with heat fixing type equipments, such as a hot calender roll method, a hot-platen method, a belt fixing method, a flash plate fixing method, an oven-fusing method, etc. with which the anchorage device of a film heating method is otherwise known \*\*. Since power-saving and wait time shortening (quick-start nature) are attained since a low heat-capacity linear heating object can be used, and the point established [ \*\*. ] and an isolation point can set up independently, Offset is also prevented, in addition it has an advantage with the various solvable defects of other method equipments, and is effective.

[0004] Configuration model drawing of the important section of this equipment was shown in drawing 8. 20 makes a drawing carry out fixed support, and is arranged in it at the inferior—surface—of—tongue side of the heater base material 21 which makes it straight side perpendicularly and which it is oblong, is a heating object (it is hereafter described as a heater) of low heat capacity, and has rigidity and adiathermic ones. 25 is a heat—resistant film (it is hereafter described as a fixing film), 28 is an elastic pressure roll as a pressurization member, the fixing film 25 is made to insert between them, the pressure welding of the above—mentioned heater 20 and above—mentioned pressure roll 28 which carried out fixed support is carried out, and the heating nip section (it is hereafter described as the fixing nip section) N is made to have formed. Transit conveyance of the fixing film 25 is carried out at the rate of predetermined in the direction of a of \*\*\*\* in the fixing nip section N, carrying out adhesion sliding in the fixing nip section N by the non-illustrated driving means or the rotation drive of a pressure roll in the field of a heater 20.

[0005] In the condition that transit conveyance of the fixing film 25 was carried out at the rate

'of predetermined, and the \*\* tone of the heater 20 was carried out to a predetermined temperature. The record medium P which supported the non-established toner image T as heated material between the fixing film 25 of the fixing nip section N and the pressure roll 28 makes an image side a fixing film side, and by conveyance installation being carried out This record medium P sticks the fixing nip section N to the field of the fixing film 25, and pinching conveyance of the fixing nip section N is carried out together with the fixing film 25. The image support side of a record medium P is heated at a heater 20 through the fixing film 25 in a fixing nip section passage process, the non-established toner image T becomes soft and fuses, and heat fixing is made. From the 25th page of a fixing film, the record medium which passed the fixing nip section N carries out curvature separation one by one, and discharge conveyance is carried out.

[0006] Generally, what makes a basic construct the energization heating element 23 with which the heater 20 as a heating object was formed in the fixing film opposed face side of the heat-resistant heater substrate 22 and this substrate along with substrate straight side thin band-like one is used. The overcoat layer for heater surface protections which 24 made cover the heating element forming face side of the heater substrate 22, and 29 are the heater temperature detector elements arranged in the rear-face side of the heater substrate 22.

[0007] The temperature up of the heater 20 is carried out to a heating element 23 by pyrexia of this heating element by energization being made, feed of the heater temperature information is carried out to a non-illustrated energization control circuit from the temperature detector element 29, and the energization to a heating element 23 is controlled and \*\*-tone-managed so that a heater 20 may be maintained by predetermined temperature.

[0008] The width of face W of a heating element 23 (size of a film and the record-medium conveyance direction) was almost equivalent to the width of face of the fixing nip section N, or was set as less than [it], is considering as the configuration which carries out the correspondence location of the heating element 23 into the fixing nip section N, and had become the configuration of concentrating and heating only the inside of the fixing nip section N as much as possible.

[0009] However, in order that it is rapidly heated by inrush and coincidence and the moisture into the fixing nip section N contained in the record medium serves as a steam, and the record medium P which supported the non-established toner image T may blow on a record-medium conveyance entrance side and may come out from the fixing nip section N if it rushes in if it is made such a configuration, the non-established toner image T on a record medium P flies, and is legible in the so-called "spilling" phenomenon powder carried out.

[0010] By then, the thing which you make the heating object 20 broad like <u>drawing 9</u>, and is made for a film and the record-medium conveyance direction upstream to possess way extension overhang section 20A outside the heating object 20 from the fixing nip section N Making a record medium P pre heat by way extension overhang section 20A outside this heating object 20 before fixing nip section inrush, carrying out desiccation of this record medium and viscous raising of Toner T, and suppressing the above-mentioned spilling phenomenon in the fixing nip section N is known.

[0011]

[Problem(s) to be Solved by the Invention] However, the time of the conditions out of which spilling of images in case a record medium contains many moisture by the class and high-humidity environment of a record medium tends to come also in the equipment of the pre heating configuration of above-mentioned drawing 9. When the quick start tended to be carried out from the time of the anchorage device having got cold, in pre heating unit 20A in front of the fixing nip section, the condition that pre heating which makes enough desiccation of a record medium and viscous raising of Toner T was not made might also be produced, and spilling might occur.

[0012] Although this invention is similarly the heating apparatus of a pre heating method, if the condition that it is always fully unstable is made to secure and it is in an image heating anchorage device, without pre heating of the material in front of the heating nip section heated [introductory] being influenced by an operating environment, the service condition, etc., the

heating apparatus which enabled it to prevent generating of the above image spilling phenomena certainly, and the image—formation equipment equipped with this heating apparatus as heating anchorage devices are offered.

[0013]

[Means for Solving the Problem] This invention is heating apparatus and image formation equipment which are characterized by the following configuration.

[0014] (1) Make a film insert between heating objects and pressurization members by which fixed support was carried out, and make the heating nip section form in it. It is the heating apparatus which introduces heated material between a film of this heating nip section, and a pressurization member, is made to carry out pinching conveyance of the heating nip section together with a film, and heat—treats heated material. A portion which a heating object is equipped with a heating element prolonged in the direction of a right angle in the conveyance direction of a film and heated material in the heating nip section, and this heating element has in a heating nip section field, It has a portion in a heating nip outside by the side of heated material carrying in of the heating nip section. As for a heating object, an opposed face with heated material has a folding point in a film and the heated material conveyance direction upstream rather than the heating nip section. a slant face which goes to a film and the heated material conveyance direction upstream from the folding point and where it is alike, and it follows and an opposed face with heated material of a heating object keeps away from a heating nip section horizontal line — \*\*\*\*

heating apparatus characterized by carrying out sliding migration while it gets down and a film approaches or contacts the slant face.

[0015] (2) calorific value of a portion which is in a heating nip outside of Q1 and this heating element about gross calorific value of a heating element — Q2 \*\* — a time of carrying out — 0.1 — < — heating apparatus given in (1) characterized by making it set to Q2/Q1 <0.4. [0016] (3) A heating object is heating apparatus given in (1) characterized by having exoergic distribution to which calorific value becomes large toward the downstream from a film and the heated material conveyance direction upstream, or (2).

[0017] (4) Heating apparatus of any one publication of (1) characterized by arranging a heating element including a folding point of a heating object thru/or the (3).

[0018] (5) Heating apparatus of any one publication of (1) characterized by being the record medium which supported an image with which heated material should be established, and equipment being a heating anchorage device which makes this record medium carry out heat fixing of the image thru/or the (4).

[0019] (6) Image formation equipment which has an image formation means to form a non-established image in a record medium, and a heating fixing means to make a record medium carry out heat fixing of the non-established image, and is characterized by this heating fixing means being the heating apparatus of any one publication of (1) thru/or the (4).

[0020] Namely, heat generated from a heating element portion of a heating nip outside by considering as the above-mentioned configuration Because it not only warms heated material before rushing into the heating nip section, but a heating object has the slant face section (chamfer) in a film and the heated material conveyance direction upstream rather than the heating nip section Since heat mainly emitted from a heating element portion of a heating nip outside as the result by heat capacity becoming [ volume for this heating soma as a pre heating unit ] small small gets across to a part for this heating soma as a pre heating unit on an effect target more, Temperature for this heating soma tends to become high, heat can also be efficiently told to a film which approaches or contacts and slides on that, and the condition of fully being made is always secured to stability, without heated material pre heating before the heating nip section being influenced by an operating environment, service condition, etc. [0021] Before heated material rushes into the heating nip section, it is pre heated in a process in which a part for a heating soma as the above-mentioned pre heating unit is passed. If it is in an image heating anchorage device, generating of image spilling by the heating nip section (fixing nip section) can be prevented by a record medium being dried by the pre heating, and viscous raising of a toner of a non-established toner image being made. Moreover, since it becomes hot gradually before a record medium results in the heating nip section in a part for a heating soma

as a pre heating unit which has the above-mentioned slant face section, an effect is not to generate a steam explosively at the time of heating nip section inrush, and prevent generating of spilling.

[0022]

[Embodiment of the Invention]

<Operation gestalt 1> ( drawing 1 - drawing 3 )

(1) The whole equipment block diagram 1 is an outline block diagram of the heating apparatus of this operation gestalt. The heating apparatus of this example is an image heating anchorage device of a film heating method. The same sign is given to the configuration member portion which is common to the equipment of above-mentioned drawing 8 or drawing 9, and explanation for the second time is omitted.

[0023] In drawing 1, 26 and 27 are the drive rolls and follower rolls which were arranged in the heater 20 as a heating object made to hold to a base material 21 [ abbreviation ]. The fixing film 25 as a heat-resistant film is used as the endless-belt-like film, and has carried out the \*\*\*\* set-up of this film 25 among the three above-mentioned members 26\*\*27\*\*20.

[0024] The rotation drive of the drive roll 26 is carried out by the driving source device M at the clockwise rotation of \*\*\*\*. The follower roll 27 makes it serve as the tension roll of the endless—belt—like fixing film 25, and the rotation drive of the fixing film 25 is carried out without Siwa, meandering, and speed delay with the same peripheral velocity as the bearer rate of the record medium P which supported the non-established toner image T currently conveyed by the clockwise rotation a from the predetermined peripheral-velocity, i.e., the non-illustrated image formation section, side with the rotation drive of a drive roll 26 on the upper surface.

[0025] The pressure roll 28 as a pressurization member is a roll which has the good rubber elastic layer of mold—releases characteristic, such as silicone rubber. Make the descending side film portion of the aforementioned endless—belt—like fixing film 25 pinch, carry out an opposite pressure welding with the contact pressure of 4–7kg of total pressure to the inferior surface of tongue of said heating object 20 with an energization means, and the fixing nip section N is made to have formed. Follower rotation is carried out at the counterclockwise rotation of the forward direction in the transit conveyance direction in the fixing nip section N of a film 25.

[0026] Since heating fixing of a toner image is repeatedly presented with the fixing film 25 of the

shape of an endless belt by which a rotation drive is carried out, it is excellent in thermal resistance, a mold-release characteristic, and endurance, and, generally uses the thing of thin meat 40 micrometers or less preferably the total thickness of 100 micrometers or less.

[0027] for example, it is \*\*\*\*\*\*\*\* etc. at 10-micrometer thickness about the mold-release characteristic coat layer of the monolayer film of heat-resistant resin, such as polyimide polyether imide and PES-PF (ethylene tetrafluoride-perfluoroalkylvinyl ether copolymer resin), or a compound layer film, for example, 20-micrometer thickness film, which added electric conduction material to fluororesins, such as PTFE (polytetrafluoroethylene resin) and PAF, at least at the image contact side side.

[0028] The following (2) terms explain the details configuration of the heater 20 as a heating object.

[0029] The heater base material 21 can consist of composite material of high heat resistant resin, such as PPS (polyphenylene sulfide), PAI (polyamidoimide), PI (polyimide), PEEK (polyether ether ketone), and a liquid crystal polymer, these resin, a ceramic metal, glass, etc., etc. [0030] In the condition that \*\*(ed), transit conveyance of the fixing film 25 was carried out at the rate of predetermined like the equipment of above—mentioned drawing 8 or drawing 9, and the \*\* tone of the heater 20 was carried out to a predetermined temperature, heat fixing of the non-established toner image T is carried out at a record medium P by conveyance installation of the record medium P as heated material being carried out between the fixing film 25 of the fixing nip section N, and a pressure roll 28.

[0031] (2) the <u>block diagram 2</u> of a heater 20 showed expansion model drawing of a heater portion, and <u>drawing 3</u> showed the heating element forming face side of a heater — it is a notch perspective diagram a part.

[0032] The heater substrates 22 are the thickness of 1.0mm, width of face of 10mm, a right

conductor with a length of 40mm, for example, an alumina, alumimium nitride, etc., and, as for the film and the record-medium conveyance direction upstream (it is hereafter written as the conveyance direction upstream) by the side of the heating element forming face of this heater substrate 22 (substrate surface side), beveling with a thickness of 0.5mm is performed to width of face of 2mm. b is the chamfer.

[0033] A heating element 23 is an energization heating element of the linear or band-like low heat capacity which coating of the screen-stencil etc. was carried out [ heat capacity ] to width of face of W= 2.5mm, and made electric resistance materials, such as Ag/Pd, RuO2, and Ta2 N, provide along with the longitudinal direction on the surface of a substrate.

[0034] 31-31 is the electrode for electric supply which was made to connect to the both ends of the above-mentioned heating element 23, and the both-ends side on the surface of a substrate was made to carry out formation possession, for example, by screen-stencil etc., carries out coating of Ag etc. and forms it.

[0035] The overcoat layer 24 for heater surface protections is a thin layer of heat-resisting glass.

[0036] In the condition of having made the fixing film 25 inserting an above-mentioned heater 20 and an above-mentioned pressure roll 28, and having made the fixing nip section N of predetermined width of face forming, the heating element 23 is made the related configuration from which the width-of-face section has protruded a part of conveyance direction upstream of the width-of-face section into the fixing nip outside by the side of record-medium carrying in of the fixing nip section N while carrying out the correspondence location at the fixing nip section N like drawing 2. Wa is the heating element flash section.

[0037] Moreover, said chamfer of the heater substrate 22 is \*\*\*\*\*\*ed and located in the fixing nip outside by the side of record-medium carrying in of the fixing nip section N. namely, a slant face where an opposed face with the record medium as heated material has a folding point c in the conveyance direction upstream, and, as for a heater 20, goes to the conveyance direction upstream from the folding point c from the fixing nip section N and where it is alike, and it follows and an opposed face with the record medium of a heater 20 keeps away from a fixing nip section horizontal line — \*\*\*\* — it gets down, and sliding migration is carried out while the fixing film 25 approaches or contacts the slant face. Method extension overhang section of outside of heater 20A containing the above-mentioned beveling slant face section of the conveyance direction upstream becomes the pre heating unit of a record medium P from the fixing nip section N.

[0038] It:\*\*, and the aforementioned heating element flash section Wa heats method overhang section of outside of heater 20A containing the above-mentioned beveling slant face section as a pre heating unit of a record medium, while giving heat energy to the record medium P before fixing nip section inrush. In this case, since it gets across to method extension overhang section of outside of heater 20A effectively [ this method extension overhang section of outside of heater 20A / heat capacity becomes small by beveling b carrying out the heater substrate 22, and / the generating heat in the heat to generate, especially the heating element flash section Wa of a heating element 23 ], the temperature of this method extension overhang section of outside of heater 20A becomes easy it becoming high. therefore, the condition of fully be make be always secure to stability, without also being able to tell heat effectively to the fixing film 25 which carry out sliding migration, and record medium pre heating before the fixing nip section be influence by an operating environment, the service condition, etc., approach or contact the slant face section of this method extension overhang section of outside of heater 20A. [0039] Before the record medium introduced into the fixing nip section N rushes into the fixing nip section N Mind the fixing film 25, and approach or contact and method extension overhang section of outside of heater 20A containing the above-mentioned beveling slant face section as a pre heating unit is passed. Even if it is gradually warmed in the passage process, desiccation and viscous raising of a toner are made and directly powerful heat is finally applied from the heating element flash section Wa just before the fixing nip section, there is no generating of an explosive steam and generating of the spilling phenomenon of a non-established toner image can be prevented.

[0040] <a href="mailto:comparation">comparation</a> gestalt 2> — since there are too few the effects are before fixing nip section inrush and pre heat a record medium, in the equipment of the above-mentioned operation gestalt 1 when the heating element flash section Wa has too little this — sufficient effect profit — hard — it becomes, and when many [ too ], make a heater substrate 22 produce a crack and \*\*\*\*\* is also. Since the direction of air has [ this ] bad thermal conductivity compared with a pressure roll 28, as for the portion Wa of the fixing nip outside of a heating element 23, temperature tends to become high. Therefore, if the amount of heating element flashes from the fixing nip section N is made [ many ] too much, since a temperature gradient will become large by fixing nip circles and the fixing nip outside, the strain of a substrate 22 by thermal expansion will increase, and it will break as the result.

[0041] Then, this operation gestalt was investigated about the rate into which a heating element 23 is made to protrude from the fixing nip section N.

[0042] As shown in drawing 2 and drawing 3, width of face of W and the heating element flash section is set to Wa for full [ of a heating element 23 ]. Moreover, it is the calorific value of Q1 and a heating element flash portion about the gross calorific value of a heating element 23 Q2 It is Q1 by changing W for full [ of a heating element 23 ], when it carries out. Q2 A ratio is changeable.

[0043] It is table 1, table 2 and a table 3Q1, and Q2. The spilling phenomenon at the time of making it change and the crack of a heater substrate are summarized.

[0044] Setting a table 1 to W= 2.5mm, the thing table 2 which beveled to the substrate 22 is set to W= 4.5mm, and the thing table 3 which beveled to the substrate 22 is set to W= 2.5mm, and does not bevel to a substrate 22.

[0045] When it bevels from a table 1 and a table 2 to a substrate 22, it is Q2 / Q1. It turns out that it will scatter if close is in 0.4 from 0.1, and a substrate crack does not happen. Moreover, it became almost the same [ a result ] as for a with a width-of-face sizes [ other than two ] (the 2.5 above-mentionedmm and 4.5mm) thing about W.

[0046] moreover, it bevels from a table 3 to a substrate 22 — \*\* — it scatters, and since there is no place where a substrate crack both does not occur, it turns out that a substrate 22 is beveled.

[0047] Therefore, a heating element 23 is made to protrude into the fixing nip outside of the conveyance direction upstream from the fixing nip section N. By the heater substrate portion made to jut out over the conveyance direction upstream beveling, and constituting from the fixing nip section N in the relation of 0.1<Q2/Q1 <0.4 The record medium before fixing nip section intrush can be enough pre heated without the evil of the crack of a substrate 22, and spilling can be prevented.

[0048]

[A table 1]

表 1

$Q_2 \angle Q_1$	飛び散り	基板割れ
0.05	×	0
0.1	0	0
0.2	0	0
0.3	0	0
0.4	0	0
0.5	0	Δ
0.6	0	×

[0049] [A table 2]

•	猆	2

$Q_2/Q_1$	飛び散り	基板割れ
0.05	Δ	0
0.1	0	0
0.2	0	0
0.3	0	0
0.4	0	0
0.5	0	×
0.6	0	×

[0050]

[A table 3]

表 3

}	$Q_2/Q_1$	飛び散り	基板割れ
- 12	0.05	×	
	0.1	×	0
	0.2	Δ	0
	0.3	Δ	0
	0.4	Δ	0
	0.5	0	Δ
	0.6	0	×

[0051]

[External Character 1] 表中の記号の説明

	飛び散り	基板割れ
ó	発生なし	割れない
Δ	発生するが実用上問題無し	割れることがある
×	発生する	割れる

<Operation gestalt 3> ( drawing 4 )

This operation gestalt forms the heating element 23 in two fields, 23A and 23B, in the cross direction like <u>drawing 4</u>. Field 23B is in the conveyance direction upstream to field 23A, and the calorific value per unit area is very small rather than field 23A.

[0052] In the case of this operation gestalt, field 23A is width-of-face WA =0.4mm of whole heating element width of face containing field 23B of W= 2.0mm, and field 23A, and width-of-face WB =1.6mm of field 23B, and, in the calorific value of field 23A, the calorific value of field 23B has become 20% of the heating element 23 whole 80% of the calorific value of the heating element 23 whole.

[0053] If it is made such a configuration, in order to fulfill the conditions of 0.1<Q2/Q1 <0.4 shown in the operation gestalt 2, the conveyance direction upstream edge of the fixing nip section N should just come between 0.8mm and 1.7mm (i.e., the inside of 0.9mm) about from the conveyance direction upstream of a heating element 23.

[0054] To it, if it is a heating element with a same width of face of 2mm when calorific value per unit area of a heating element is used as a common whole surface homogeneity heating element,

the conveyance direction upstream edge of the fixing nip section N will have to enter among 0.2mm to 0.8mm, i.e., 0.6mm, from the conveyance direction upstream of a heating element 23 about, and it will be set to two thirds of these operation gestalten.

[0055] although the width of face of the fixing nip section N tend to change with the thermal expansion, the eccentricity, etc. of a pressure roll 28, it can pre heat a record medium effectively [ before result in the fixing nip section ], and adjustment of the location of the fixing nip section N not only become easy, but it prevent spilling of a toner image by consider as a heating element configuration like this operation gestalt, reduce the danger that evils, such as a heater substrate crack, will happen.

[0056] <Operation gestalt 4> ( drawing 5 )

Like <u>drawing 5</u>, in the heating element, this operation gestalt includes the folding point c of chamfer b of the heater substrate 22, and is arranged. That is, the heating element 23 is arranged ranging over chamfer b of the heater substrate 22. Moreover, the folding point c of beveling is in agreement with the edge of the fixing nip section N of the conveyance direction upstream. A chamfer has the advantage in which the location of fixing nip \*\*\*\* does not change even if there are the thermal expansion and eccentricity of a pressure roll 28, when not only an effect but the folding point a and the location of fixing nip \*\*\*\* which were explained with the operation gestalt 1 are doubled.

[0057] Therefore, since the location of the nip edge of the conveyance direction upstream of the fixing nip section N cannot change easily according to this operation gestalt, Reducing the danger that the ratio of the calorific value in the fixing nip section N and the calorific value besides the fixing nip section N will stop being able to change easily, and evils, such as a heater substrate crack, will happen, a record medium can be pre heated effectively [ before resulting in the fixing nip section N ], and spilling of a toner image can be prevented.

[0058] <Operation gestalt 5> ( drawing 6 )

(a) -(b) - (c) of <u>drawing 6</u> shows other examples of a configuration gestalt of the heating apparatus of a film heating method, respectively.

[0059] The thing of (a) carries out the \*\*\*\* set-up of the heat-resistant endless-belt-like film 25, and is made to carry out the rotation drive of this film 25 between the heater 20 as a heating object, and drive roll 26 member.

[0060] The thing of (b) makes the outside of the heater base material 21 of a cross-section abbreviation semicircle arc which made the heater 20 hold attach the heat-resistant cylinder—like film 25 outside an inferior surface of tongue loosely, makes this film 25 insert, and carries out the opposite pressure welding of the pressure roll 28 to a heater 20. A film 25 is rotated carrying out the rotation drive of the pressure roll 28, and making a heater 20 carry out adhesion sliding of the film inside by the frictional force of the film 25 in the fixing nip section N, and a pressure roll 28.

[0061] The thing of (c) lets this out, makes it go via a heater 20 from a shaft 32 using the owner edge film of the long picture made into the roll volume as a heat-resistant film 25, is rolled round, and it is constituted so that transit migration may be carried out at the rate of predetermined to a shaft 33.

[0062] Also in the heating apparatus of the film heating method of such a configuration gestalt, this invention is effectively applicable.

[0063] <Operation gestalt 6> ( drawing 7 )

<u>Drawing 7</u> is the outline block diagram of the example of image formation equipment. The image formation equipment of this example is the copying machine or printer of imprint type electrophotography process use.

[0064] 41 is the electrophotography photo conductor of a rotating—drum mold, and a rotation drive is carried out with a predetermined process speed (peripheral velocity) at the clockwise rotation of an arrow head.

[0065] 42 is a contact electrification roll as a photo conductor electrification means, predetermined electrification bias is impressed and electrification processing of the 41st page of the rotation photo conductor is uniformly carried out to predetermined polarity and potential with this electrification roll 42.

[0066] The exposure 43 of the target image information is made by the non-illustrated image information exposure means sections (the slit image formation exposure means of a manuscript image, laser beam scan exposure means, etc.) to the electrification processing side of this rotation photo conductor 41, and the electrostatic latent image corresponding to the target image information is formed in the 41st page of a rotation photo conductor.

[0067] The latent image is developed as a toner image by toner development equipment 44.

[0068] The toner image is imprinted from the non-illustrated feed section by the imprint section which was contacted to the rotation photo conductor 41 and this and which is the pressure—welding nip section with the transfer roller 45 with which predetermined imprint bias is impressed to the imprint material P as a record medium conveyed to predetermined timing.

[0069] The imprint section is passed, the imprint of a toner image is separated from the 41st page of a rotation photo conductor, for example, conveyance installation is carried out, and the carrier beam imprint material P receives heating fixing processing of a non-established toner image in the heating apparatus 50 as an image heating anchorage device of above-mentioned drawing 1, and is outputted to it as a copy or a print.

[0070] The 41st page of the rotation photo conductor after the toner image imprint to the imprint material P is cleaned by cleaning equipment 47 in response to removal of residual affixes, such as the imprint remaining toner, and imaging is repeatedly presented with it.

[0071]

[Effect of the Invention] According to this invention, as mentioned above about the heating apparatus of a film heating method and a pre heating method The condition that it is always fully unstable, without pre heating of the material in front of the heating nip section heated [introductory] being influenced by an operating environment, the service condition, etc. is securable. If it is in an image heating anchorage device, generating of an image spilling phenomenon can be prevented certainly, and quality improvement of an output image can be attained in image formation equipment equipped with this image heating anchorage device and this image heating anchorage device.

[Translation done.]

#### \* NOTICES \*

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- 3.In the drawings, any words are not translated.

#### DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The outline block diagram of the heating apparatus of the operation gestalt 1

[Drawing 2] Expansion model drawing of a heater (heating object) portion

[Drawing 3] the part which showed the heating element forming face side of a heater — a notch perspective diagram

[Drawing 4] the part which showed the heating element forming face side of the heater in the heating apparatus of the operation gestalt 3 — a notch perspective diagram

[Drawing 5] the part which showed the heating element forming face side of the heater in the heating apparatus of the operation gestalt 4 — a notch perspective diagram

[Drawing 6] (a) –(b) – (c) is drawing of the example of a configuration gestalt of everything but the heating apparatus of a film heating method respectively.

[Drawing 7] The schematic diagram of the example of image formation equipment

[Drawing 8] Configuration model drawing of the heater of conventional equipment (the 1)

[Drawing 9] Configuration model drawing of the heater of conventional equipment (the 2)

[Description of Notations]

20 Heating Object

22 Substrate

23 Heating Element

24 Surface-Protection Layer

25 Heat-resistant Film

26 Drive Roll

27 Follower Roll

28 Pressure Roll (Pressurization Member)

b Beveling slant face section

c Folding point

N Heating nip section

W Heating element width of face

Wa Heating element flash section

20A Pre heating unit

P Heated material (record medium)

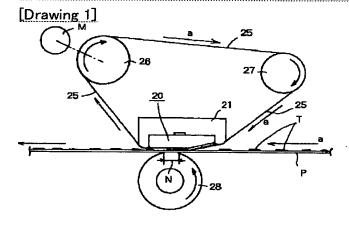
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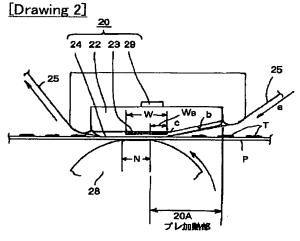
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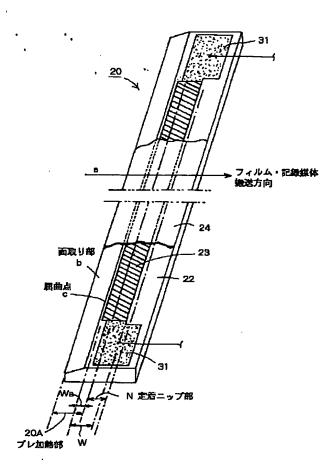
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#### **DRAWINGS**

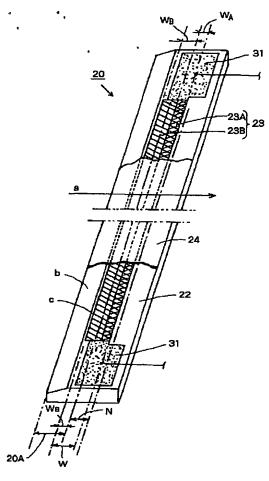


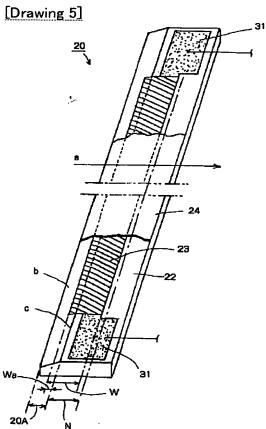


#### [Drawing 3]

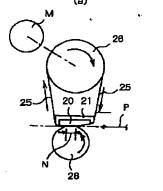


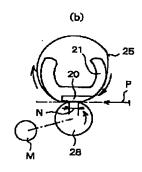
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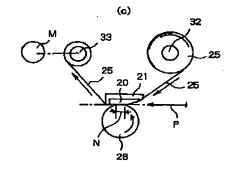




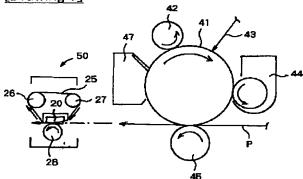
### [Drawing 6]

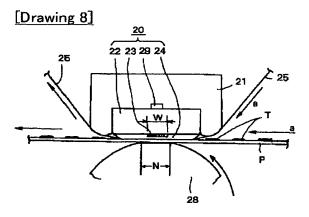




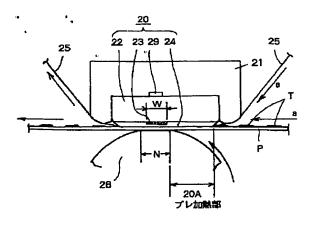


#### [Drawing 7]





[Drawing 9]



[Translation done.]

# (19) 日本国格群庁 (JP)

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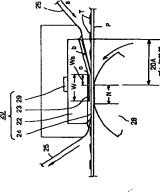
(51) Int (11		中心 西蒙	<b>小乙醇田粉</b> 草	<u> </u>			花落粉水糖籽
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# (54) 【発明の名称】 加熱装置及び函像形成装置

**【禁題】 フィルム加黙方式・プレ加黙方式の加黙装置** にして、、「白蛇 リップ 部性の 単入被 古蛇 がの プァ 加 歌 か 使用環境・使用条件等に左右されることなく常に安定に 十分になされる状態を確保して、画像加熱定着装置にあ 【解決手段】 加熱体20は加熱ニップ部Nにおける被 数格幣体は加幣ニップ部倒換内にある部分と、加幣ニッ からも、加敷体は被加敷材Pトの対向固が加敷ニップ部 も、 数配曲点から被加敷材敷 法方向上流倒に行くにした **がした台戦存の被台戦だかの立何固が台戦ニップ部长**中 線から遠ざかるような斜面りをもち、フィルムがその斜 プ部の被加熱材骸入側の加熱ニップ部外にある部分Wa っては画像飛び散り現象の発生を確実に防止すること。 加熱材搬送方向に直角方向に延びる路敷体23を備え、 よりも被加熱材搬送方向上流側において屈曲点。をも **面に近接もしくは後触しながら揺動移動すること。** 



## 特許請求の範囲

にフィルムを挟ませて加黙ニップ節を形成させ、駿加熱 してフィルムと一緒に加熱ニップ部を挟持搬送させて被 【請求項1】 固定支持された加熱体と加圧部材との関 ニップ部のフィルムと加圧部材との間に被加敷材を導入 加熱材を加熱処理する加熱装置であり、

白戦体は加戦ニップ部におけるフィルム・被加戦なの截 送方向に直角方向に延びる発熱体を備え、該発熱体は加 戦ニップ部領域内にある部分と、加戦ニップ部の被加熱 **材搬入側の加敷ニップ部外にある部分をもち、** 

その屈曲点からフィルム・被加繋材搬送方向上流側に行 **右戦体は被挡艦 などの対向 固が指数 ニップ 部より もフィ** くにしたがった台幣存の被占幣などの対向面が占拠ーツ トムがその斜面に近接もしくは接触しながら褶動移動す **ブ部水平線から遠ざかるような斜面をもっており、フィ** ルム・被加熱材搬送方向上流倒において屈曲点をもち、 **ることを特徴とする加熱装置。**  [請求項2] 発熱体の総発熱量をの1、数発熱体の加 **熟ニップ部外にある部分の発釈量をQ2 としたとき、** 

となるようにしたことを特徴とする請求項1に配載の加 0. 1<Q2/Q1<0. 4

を有することを特徴とする請求項1または請求項2に配 【請求項3】 加熱体はフィルム・被加熱材搬送方向上 流側から下流倒にむかって路敷虫が大きくなる路敷分布 載の加製装置。 発表体が加熱体の屈曲点を含んで配散さ れていることを特徴とする請求項1乃至請求項3のいず たや1 しに 酌製の 占账 被 阿。 [野妖怪4]

[情水項5] 被加熱材が定着すべき画像を担持した記 殿媒体であり、装置が鞍配録媒体に画像を熟定着させる 加勲定着装置であることを特徴とする静水項1乃至静水 掻4のいずれか1 しに記載の拡影被闘。

【請求項6】 記録媒体に未定着画像を形成する画像形 **成手段と、その未定着画像を配録媒体に熱定着させる加** 熱定着手段を有し、1数加熱定着手段が請求項1乃至請求 頃4のいずれか1 つに記載の加熱装置であることを特徴 とする画像形成装置。

## 【発明の雑笛な説明】

[000]

「発明の属する技術分野」本発明は、固定支持された加 部を挟持機送させて被加敷材を加敷処理するフィルム加 熱体と加圧部材との間にフィルムを挟ませて加熱ニップ 熱方式の加熱装置、及び数加熱装置を画像の加熱定着装 部を形成させ、数加釈ニップ部のフィルムと加圧部材と **り間に被加敷材を導入してフィルムと一緒に加敷ーップ** 置として備えた画像形成装置に関する。

【従来の技術】上記のようなフィルム加熱方式の加熱装 置は特開昭63-31318号公報等に開示されてお 0002

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特開平9-22773

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クシミリ・マイクロフィルムリーダプリンター・画像教 **示(ディスプフイ)装置・記録機等の画像形成装置にお** 成プロセス手段により加熱溶融性の樹脂等よりなるトナ (転写) 方式もしくは直接方式で形成した目的の画像情 り、例えば、複写機・レーザーピームプリンター・ファ いて、電子写真・静電記録・磁気記録等の適宜の画像形 ーを用いて配録媒体 (転写材シート・エレクトロファッ クスシート・静電配録シート・印刷紙など)の面に間接 報に対応した未定着のトナー画像を永久固着画像として 加熱定着処理する画像定着装置として括用できる。 2

が別に散定できるため、オフセットも防止される、その 【0003】フィルム加敷方式の定着装置は、他に知ら ラッシュ定着方式・オープン定着方式等の熱定着式装置 イックスタート性)が可能になり、◎.定着点と分離点 他、他の方式装置の種々の欠点を解決できるなどの利点 れている釈ロール方式・黙板方式・ベルト定着方式・フ との対比において、O. 低熱容量機状加熱体を用いるこ とができるため、省電力化・ウエイトタイム短縮化(ク を有し、効果的なものである。

の加黙体(以下、ヒーターと記す)であり、即柱・断煞 て配散してある。25は耐熱性フィルム(以下、定着フ **一ル28とをその間に定着フィルム25を挟ませて圧接** させて加戦ニップ部(以下、危着ニップ部と記す)Nを 形成させてある。定着フィルム25は不図示の駆動手段 もしくは加田ロールの回転勝動により、仮格ニップ部N 【0005】定着フィルム・25が所定の速度で走行機送 され、ヒーター20が所定の温度に温調された状態にお いて、定着ニップ部Nの定着フィルム25と加圧ロール た。20は図面に垂直方向を長手とする横長で低熱容量 性を有するヒーター支持体21の下面側に固定支持させ ィルムと記す)、28は加圧的材としての弾性加圧ロー ルであり、上記の固定支持させたヒーター20と加圧ロ においてヒーター20の面に密着宿動しながら定着ニッ プ部Nを矢示のa 方向に所定の速度で走行搬送される。 【0004】図8に歓装置の要部の構成模型図を示し ន ೫

28との間に、被加敷材としての、未定着トナー画像T 象送導入されることで、数配録媒体Pは定着ニップ部N を定着フィルム25の面に密着して定着フィルム25と 一緒に定着ニップ部Nを挟持機法されていき、定着ニッ プ部通過過程で記録媒体アの画像担枠面が定着フィルム 像Tが軟化・路融して熱定着がなされる。定着ニップ部 Nを通過した配砂媒体は定着フィルム25面から順次に を担持した記録媒体Pが画像面を定着フィルム側にして 25を介してヒーター20で加熱されて未定着トナー區 **抽琢分離して排出搬送される。 \$** 

**射釈性のヒーター基板23と、較基板の定増フィルム対 向面側に基板長手に沿って細帯状に形成された通電路敷** 体23を基本権成体とするものが用いられている。24 はヒーター基板22の発熱体形成面側を被覆させたヒー 【0006】 一截に、 哲慜 存としてのヒーター20は、

体の発熱でヒーター20は昇温し、温度検知案子29か **ろ不図示の通電制御回路にヒーター温度情報がフィード** されて、ヒーター20が所定の温度に維持されるように [0007] 発熱体23に通電がなされることで酸発熱 発勲体23への通電が制御され温鯛管理される。

送方向の寸法)は定着ニップ部Nの幅とほぼ同等かそれ [0008] 発釈体23の幅W (フィルム・記録模体数 ップ部Nから記録媒体被送入口回に吹き出る為に、記録 以下に設定され、その発熱体23を定着ニップ部N内に 対応位置させる構成とすることで、できる限り定着ニッ 未定着トナー画像Tを担持した配録媒体Pが定着ニップ 記録媒体中に含まれていた木分が木森気となって定着ニ 媒体P上の未定着トナー画像Tが飛び散らされてしまう 部N内への突入すると、突入と同時に急激に加熱され、 [0009] しかしながら、このような構成にすると、 プ售N内のみを低中して加軽する構成となっていた。 所謂「飛び散り」現象を見やすい。

[0010]そこで、図9のように加熱体20を幅広に して定着ニップ部Nよりもフィルム・記録媒体概法方向 上流側に加熱体20の外方延長張り出し部20Aを具備 させることで、記録媒体Pを定着ニップ部祭入前に鞍加 数記録媒体の乾燥、トナーTの粘性上げをして定着ニッ 敷体200外方延長張り出し部20Aでプレ加熱させて プ部Nでの上記の飛び散り現象を抑えることは知られて

[発明が解決しようとしている課題] しかしながら、上 類や高極環境で配録媒体が水分を多く含む場合などの画 て、記録媒体の乾燥やトナーTの粘性上げを十分にする **巡図9のプレ加製構成の装置においても、記録媒体の種** 像の飛び散りが出やすい条件のときや、定着装置が吊え きっている時点からクイックスタートさせようとしたと きなどには、定格ニップ部街のプレ加敷街20Aにおい プレ加黙がなされない状態も主じて飛び散りが発生して しまうことがあった。 [0011]

あるが、加熱ニップ部前の導入被加熱材のプレ加熱が使 用環境・使用条件等に左右されることなく常に安定に十 分になされる状態を確保させて、画像加熱定着装置にあ っては前述のような画像飛び散り現象の発生を確実に防 止できるようにした加熱装置、及び隊加熱装置を加熱定 【0012】本発明は同じくプレ加敷方式の加敷装置で 着装置として備えた画像形成装置を提供するものであ

[限題を解決するための手段] この発明は下記の構成を **作散とする加熱装置及び画像形成装置である。**  S

【0014】 (1) 固定支持された加熱体と加圧部材と

かるような斜面をもっており、フィルムがその斜面に近 接もしくは接触しながら褶動移動することを特徴とする の間にフィルムを挟ませて加熱ニップ部を形成させ、鞍 **加熱ニップ部のフィルムと加圧部材との間に被加熱材を** 導入してフィルムと一緒に加敷ニップ部を挟持撤送させ **た被加敷材を加敷処理する加敷装置であり、加敷体は加** 黙ニップ部におけるフィルム・被加黙材の搬送方向に直 角方向に延びる発熱体を備え、鞍発敷体は加熱ニップ部 **密核内にある部分と、加黙ニップ部の被加黙材識入側の** 加製ニップ部外にある部分をもち、加敷体は被加敷材と の対向面が加熱ニップ曲よりもフィルム・被加敷材敷法 方向上流側において屈曲点をもち、その屈曲点からフィ ルム・被加密材格送方向上流倒に行くにしたがって加勢 **体の被加駅材との対向面が加戦ニップ部水中線から溢が** 

[0015] (2) 発熱体の総発熱量を41、酸発熱体 の加黙ニップ部外にある部分の発釈量をQ2 としたと

 $0.1 < Q_2 / Q_1 < 0.4$ 

となるようにしたことを特徴とする (1) に記載の加熱

分布を有することを特徴とする(1)または(2)に配 **【0016】(3)加熱体はフィルム・被加熱材機送方** 向上流倒から下流側にむかって路敷量が大きくなる路敷 載の加熱装置。

[0017] (4) 発敷体が加敷体の屈曲点を含んで配 設されていることを特徴とする(1)乃至(3)のいず

【0018】(5)被加敷材が定権すべき画像を担持し た配録媒体であり、装置が数配録媒体に画像を釈定着さ たか1 しに記載の招幣被買。

せる加熱定着装置であることを特徴とする(1)乃至 (4) のいずれか1 しに記載の加密被置。

(4) のいずれか1 しい記載の加製深置かあることを称 【0019】(6)記録媒体に未定着画像を形成する画 象形成手段と、その未定着画像を配録媒体に熟定着させ る加熱定着手段を有し、歓加勲定着手段が(1)乃至 徴とする画像形成装置。

にも敷を効率的に伝えることができ、加勲ニップ部前の やの銘する戦がより 登米色 にんプレ 白巻笛と しんの数 加 やすく、そこを近接もしくは接触して縮動するフィルム 被加熱材プレ加熱が使用環境・使用条件等に左右される 部外の発釈体部分から発生する熱は、加熱ニップ部に突 入する前の被加敷材をもたためるだけでなく、加敷体が 加熱ニップ部よりもフィルム・被加黙材機送方向上流刨 なり、その結果として主に加熱ニップ部外の路熱体部分 **において鮮洒部 (西吸り部) を有することが、プレ拉黙** 既体部分に伝わるため、数加敷体部分の温度が高くなり 【0020】即ち上記の権成とすることで、加黙ニップ **鹄としての数払黙体担分の体徴が小さく祭命曲が小さく** ことなく常に安定に十分になされる状態が確保される。

レ加熱により配録媒体が乾燥され、また未定着トナー画 L記のプレ加熱部としての加熱体部分を通過する過程で プレ加黙される。画像加熱定着装置にあっては、そのブ 彼のトナーの粘油上げがなされることで加密ニップ部 [0021] 被拍影材は挡影ニップ部へ祭入する前に、

発的に発生することがなく、飛び散りの発生を防止する とができる。また、上記斜面部を有するプレ加駅部とし **たの加製体部分で配破媒体は加製にップ部に狙る柜に参** 々に熟されるために、水蒸気が加熱ニップ部役入時に繰 (定着ニップ部) での画像飛び散りの発生を防止するこ のに効果がある。

[0022]

(東核形態1) (図1~図3) [発明の実施の形態]

(1) 装置の全体構成

図1は本実植形態の加影液質の截略構成図である。本例 の加熱装置はフィルム加熱方式の画像加熱定着装置であ る。前述図8や図9の装置と共通する構成部材部分には 同一の符号を付して再度の説明を省略する。

[0023] 図1において、26と27は支持体21に 保持させた加熱体としてのヒーター20に略並行に配設 した慇懃ロールと従動ロールである。暗釈性フィルムと しての定着フィルム25 はエンドレスペルト状フィルム としてあり、餃フィルム25を上配の3部材26・27

・20間に懸回猥散させてある。

[0024] 駆動ロール26は駆動領機構Mにより矢示 回転駆動に伴い時計方向るに所定の周速度、即ち不図示 の時計方向に回転駆動される。従動ロール27はエンド フスペラト状の近着フィケム 25のナンションローケか 兼ねさせてあり、定着フィルム25は駆動ロール26の の画像形成部側から撤送されている未定着トナー画像T を上面に担持した記録媒体Pの搬送速度と同じ周速度を もっトンワや蛇行、湖東遅れなく回動彫動される。

【0025】 加圧部材としての加圧ロール28は、シリ コンゴム等の権型性の良いゴム導柱閥を有するロールで もり、性記のエンドレスペグト状伝着フィルム25の下 行側フィルム部分を挟ませて前記加熱体20の下面に対 して付勢手段により例えば総圧4~7kgの当後圧をも フィルム25の定着ニップ部Nにおける走行搬送方向に **した対付圧破させて応略ニップ部Nを形成させてもり、** 

[0026] 回転磨御されるエンドレスペクト状の庇権 フィルム25は繰り返してトナー画像の加熱定着に供さ れるから、耐熱性・離型性・耐久性に優れ、一般的に総 ■100μm以下、好ましくは40μm以下の御肉のも

優方向の反時計方向に従動回転する。

PES・PF(4フッ化エチレンーパーフルオロアルキ **ルアニルエーデル共氧合体徴脂)などの耐密樹脂の単層** フィルム、或は複合層フィルム、例えば20mm厚フィ [0021] 例えばポリイミド・ポリエーテルイミド・

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**<b>サワン抽脂)・PAF等のフッ架粧脂に導電材を添加し** た橋型在コート層を 10ヵ日厚に施こしたものなどでが ルムの少なくとも画像当接面側にPTFE(4フッ化エ

[0028] 加整体としてのヒーター20の解指権成は

【0029】ヒータ支持体21は、例えばPPS (ポリ 久の (2) 項で説明する。

ド)、PI(ポリイミド)、PEEK(ポリエーナルエ れらの樹脂とセラミックス金属・ガラス等との複合材料 **ーテルケトン〉、液晶ポリャー等の高酸軟性樹脂や、い** フェニレンサルファイド)、PAI(ボリアミドイミ などで構成できる。

-20が所定の温度に温調された状態において、定権ニ に、被加熱材としての配像媒体Pが搬送導入されること 定着フィルム25が所定の速度で走行搬送され、ヒータ 【0030】 脜した、色浜図8や図9の装飾と回接に、 ップ部Nの定権フィルム25と加圧ロール28との関 で、記録媒体Pに未定着トナー画像Tが熟定着される。

図2はヒーター部分の拡大模型図、図3はヒーターの発 軟体形成面側を見せた一部切欠き斜視図である。 【0031】 (2) ヒーター20の構成 ន

0mm、長さ40mmの良熱伝導体、例えばアルミナや 蛮化アルミニウム等であり、骸ヒーター甚板22の発黙 体形成面側(基板表面側)のフィルム・記録媒体搬送方 向上流倒 (以下、撤送方向上流側と略配する) は幅2m [0032] ヒーター基板22は厚み1.0mm、幅1 mに対して厚さ0.5mmの面取りが行なわれている。 りがその面取り部である。

例えばA B / P d,R u O<sub>2</sub> ,T a <sub>2</sub> N等の電気抵抗材 **枠を幅W=2.5mmに強工(スクリーン印刷等)して** 具備させた、橡状もしくは帯状の低熱容量の通電路影体 【0033】発熱体23は基板衰面の長手方向に沿って ಜ

[0034] 31・31は上記発動体23の固結部に接 続させて基板教団の両端部面に形成具備させた給電用電 随であり、倒えばA 8 等をスクリーン印刷等で塗工して 形成したものである。

【0035】ヒーター安面保護用のオーバーコート層2 4 は例えば耐熱ガラスの薄層である。

に、その幅部の複送方向上流側の一部は定路ニップ部N [0036] 上配のヒーター20と加圧ロール28とを **定着フィルム25を挟ませて所定幅の定着ニップ部Nを** 形成させた状態において、図2のように、発影体23は の問録棋存数入回の庇着ニップ部外には4日したいる題 その幅部が定着ニップ部Nに対応位置しているととも 保構成にしてある。Waがその路敷体はみ出し部であ \$

[0037] またヒーター基板22の前配面取り部は定 着ニップ部Nの配録媒体搬入側の定着ニップ部外に扱り 出して位置している。即ちヒーター20は被加密材とし S

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ての配破媒体との対向面が定着ニップ部Nよりも搬送方 **向上流側において屈曲点。をもち、その屈曲点。から撥** 送方向上流倒に行くにしたがってヒーター20の記録媒 体との対向面が定着ニップ部木平線から強ぎかるような **料面をもっており、定着フィルム25がその斜面に近接** もしくは接触しながら揺動移動する。 定着ニップ部Nよ りも搬送方向上流側の、上配面取り斜面部を含むヒータ 一外方延長張り出し部20Aが配録媒体Pのプレ加熱部

ヒーター外方延長張り出し部20Aの斜面部に近接もし 部20Aの温度が高くなりやすくなる。そのため、この くは接触しながら褶動移動する定着フィルム25にも熟 を効果的に伝えることができ、定着ニップ部前の記録媒 定着ニップ部突入前の配録媒体Pに黙エネルギを与える とともに、記録媒体のプレ加慰部としての上記面取り鉛 この場合このヒーター外方延長張り出し部20Aはヒー ター基板22が面取りもされていることにより熱容量が 小さくなり、鬼獣体23の鬼士する魁、帯に駱獣体はみ 出し郜Waでの発生熱が効果的にヒーター外方延長張り 出し部20Aに伝わるため数ヒーター外方延長張り出し 体プレ加熱が使用環境・使用条件等に左右されることな 面部を含むヒーター外方張り出し部20Aを加熱する。 【0038】 屆した、 **栏間の始整存存み出**し把Maが、 く常に安定に十分になされる状態が確保される。

れて乾燥及びトナーの粘性上げがなされていき、最後に 定者ニップ部直前で、発熱体はみ出し部Waから直接強 い熟が加えられても、爆発的な水蒸気の発生がなく、米 【0040】 (実施形態2)上記の実施形態1の装置に おいて、発熱体はみ出し部Waはこれが少なすぎると定 着ニップ部突入前で記録媒体をプレ加敷する効果が少な 上記面取り斜面部を含むヒーター外方延長視り出し部2 0 Aを定着フィルム25を介して近接もしくは接触して 通過していき、その通過過程において徐々にあたためら すぎるため充分な効果得にくくなるし、また多すぎると [0039] 定着ニップ部N:c導入される記録媒体は、 G格ニップ部Nへ役入する哲に、プレ加幣部としての、 定着トナー画像の飛び散り現象の発生が防止できる。

め、発釈体23の定着ニップ部外の部分Waは温度が高 をQ2 としたとき、発熱体23の全幅をWを変えること へなりかすい。 寂りた、仮袖コップ恕Nからの略獣存み 【0041】そこで本実植形類は、発釈体23を定着二 [0042] 図2・図3に示すように、独影体230余 幅をW、発熱体はみ出し部の唱をWaとする。また発熱 体23の総発転量を01、発熱体はみ出し部分の発熱量 は加圧ロール28に比べて空気の方が敷伝導性が悪いた 4出し虫を多くしすぎると、定権ニップ部内と定権ニッ プ部外で温度益が大きくなるため、基板22は熟膨張に よるひずみが多くなり、その結果として割れてしまう。 ップ他とからはみ出させる整合について聞くてみた。

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によりQ」とQ2の比を変えることができる。

[0043] 数1・数2・数31Q]、 Q2 を変化させ たときの飛び散り現象とヒーター基板の割れについてま とめたものである。 0044]数1は、W=2、5mmとし、 基板22に 面取りをしたもの

数2は、W=4. 5mmとし、基板22に面取りをした ę 数3は、W=2.5mmとし、基板22に面取りをしな いもの

**である。** 

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[0045] 数1と数2から、基板22に面取りをした 協合、Q2 /Q」が0.1から0.4に入っていれば飛 び散り、基板割れが起こらないことがわかる。またWを 上記の2、5mmと4、5mmの2つ以外の幅寸法のも のにしても結果はほぼ同様となった。

と、飛び散り、基板割れのどちらも起きない所がないた [0046] また、喪3から、基板22に面取りをしな め、基板22には面取りが必要であることがわかる。

タ基板部分は面取りし、0. $1<Q_2$   $/Q_1<0$ .4の 【0041】したがらた、独獣体23か庇着にップ部N から被送方向上発恩の定着ニップ部外にはみ出させ、定 関係に構成することにより、基板22の割れという弊害 なしに定着ニップ部突入前の配録媒体を充分プレ加熱す 着ニップ部Nよりも被送方向上流側に張り出させたヒー ることができ、飛び散りを防ぐことができる。 8

[0048] (表 ]]

1 Q <sub>2</sub> /Q <sub>1</sub>	0,	(現の世	基板割れ
0.05	5	×	0
0.1		0	0
0.2		0	0
0.3		0	0
0.4		0	0
0.5		0	٥
9.0		0	×

[0049] **4** 

ヒーター基板22に割れを生じさせつ恐れもある。これ

無び数り ◁ ◁ 0 9,7 0.05 5 0.5 0.3 0.4 0.6 級 2 000 0 無い数り 0 0 О O 0 9,70 0.2 0.3 0.4 0.5

0 0 0 ◁

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基板割れ

表中の記号の説明

[0000] [泰3]

\* [0051] [本] 基を使り 使れることがある 目れない 育れる 発生するが実用上間環無し 3 ¥ ప Æ 発性なし 2000年 ٥

(缺格形態3) (図4)

おいて23Aと23Bの2つの倒壊で形成している。倒 **女実施形態は図4のように、発釈体23をその幅方向に** 預収23Aよりも単位面積当りの発熱量が非常に小さく 棋23Bは箘棋23Aに対して搬送方向上消倒にあり、

Bを含む発熱体全体幅W=2.0mm、領域23Aの幅  $W_A=0$ . 4 mm、徴模23Bの幅 $W_B=1$ . 6 mmで あり、個域23Aの発熱量は発熱体23全体の発熱量の 80%、飯板23Bの発敷曲は発敷体23全体の20% [0052] 本実施形態の場合、領域23Aは領域23 となっている。 【0053】このような構成にすると、実施形態2に示 は、発敷体23の複送方向上流側からおおよそ0.8m **mから1. 7mmの間、すなわち0. 9mmの中に定着** した、0.1<02/01<0.4の条件を積たすに ニップ部Nの複法方向上消傷がくればよい。

[0054] それに対し、独獣体の単位面積当りの発黙 量を、一般的な会面均一発繁体にした場合同じ幅 2mm の発熱体ならおおよそ発熱体23の搬送方向上流側から 0. 2mmから0. 8mm、すなわち0. 6mmの間に 定着ニップ部Nの撥送方向上流端が入らなければならず 本実施形態の2/3となってしまう。

定者ニップ部に至る前に効果的にプレ加熱してトナー画 **【0055】 従着ニップ部Nの値は加田ロール28の窓** 野巌や囁心などが変化しやすいものかめるが、本英橋形 態のような発熱体構成とすることで、定着ニップ部Nの 位置の閲覧が容易になるだけでなく、ヒーター基板割れ などの弊害が起こる危険性を低減させつつ、配録媒体を

**【0056】《埘粞形簪4》 (図5)** 策の飛び散りを防ぐことができる。

ップ部端の位置を合わせた場合、加圧ロール28の熟膨 の面取り部bの屈曲点cを含ませて配散してある。即ち ヒーター基板22の面取り部hをまたいで発熱体23が 記数されている。また面取りの屈曲点こが搬送方向上流 **買の仮格ニップ部Nの基と一致している。固取り部は球 極形態 1 で説明した効果だけでなく、屈曲点 a と定路**に 最や偏心があっても定着ニップ部端の位置がかわらない 本実施形態は図5のように、発釈体をヒーター基板22 という長所がある。 ಜ

[0057] したがって本架植形類によれば、宛着ニッ いため、定着ニップ部N内の路殻曲と定路ニップ部N外 の発釈歯の比が変化しにくくなり、ヒーター基板割れ等 の弊害が超いる危険性を低減つのし、配破媒体を促結に ップ部Nに至る前に効果的にプレ加製してトナー画像の プ部Nの搬送方向上流図のニップ端の位置がかわりにく

果び散りを防ぐにとができる。

図6の (a)・ (b)・ (c) はそれぞれフィルム加戦 20 と感動ロール26 部技陶にHンドアスペクト状の服 **熱性フィルム25を懸回張数して数フィルム25を回転** 【0059】(a)のものは、加熱体としてのヒーター 方式の加熱装置の他の構成形態例を示したものである。 [0058] (**城**栖形髄5) (図6) 4

[0060] (b) のものは、下面にヒーター20を保 駆動させるようにしたものである。

符させた、横断面略半円弧状のヒーター支持体21の外 数フィルム25を挟ませて加圧ロール28をヒーター2 **図に円筒状の耐繁性フィルム25をルーズに外嵌させ、** S

定着ニップ部Nにおけるフィルム25と加圧ロール28 の摩擦力でフィルム内面をヒーター20に密着褶動させ 0に対向圧接させる。加圧ロール28を回転駆動させて ながらフィルム25を回転させるものである。

【0061】 (c) のものは、脳敷性フィルム25とし **てロール巻きにした長尺の有端フィルムを用い、これを** 繰り出し輪32からヒーター20を経由させて巻き取り 軸33へ所定の速度で走行移動させるように構成したも [0062] このような構成形態のフィルム加熱方式の 加熱装置においても本発明は有効に適用できる。

[0063] (**東**植形態6) (図1)

図~は画像形成装置例の概略構成図である。本例の画像 形成装置は転写式電子写真プロセス利用の複写機或はプ リンタたわる。 【0064】41は回転ドラム型の電子写真感光体であ り、矢印の時計方向に所定のプロセススピード(周速 度)をもって回転駆動される。

[0065] 42は感光体帯電手段としての接触帯電ロ **ールかめり、形庇の帯軸パイアスが凹加されていて、こ** の特電ロール42により回転数光体41面が所定の極性

不図示の画像情報露光手段部(原稿画像のスリット結像 韓光手段、レーザピーム走査韓光手段等) により目的の 画像情報の曝光43がなされて、回転感光体41面に目 【0066】この回転数光体41の帯電処理面に対して ・電位に一様に帯電処理される。

[0061] その潜像がトナー現像装置44によりトナ 的の画像情報に対応した静電潜像が形成される。

【0068】そのトナー画像が、回転感光体41とこれ **ール45との圧接ニップ部である転写部に、不図示の給** 紙部から所定のタイミングにて搬送された配録媒体とし に接触させた、所定の転写パイアスが印加される転写ロ 一画像として現像される。

【0069】 転写部を通過してトナー画像の転写を受け **前法図1の画像加熱定格装置としての加熱装置50に接** 送導入されて未定着トナー画像の加駅定着処理を受け、 た転写材Pは回転感光体41面から分離され、例えば トの既算女Pに対した既師されたいく。

[0070] 哲学材Pに対するトナー画像配写後の回覧 啓光体41面はクリーニング装置47により転写残りト ロピー製はプリントとした出力される。

ナー毎の残留付着物の除去を受けて情掃され、繰り返し **て作像に供される。** 

0071

等に左右されることなく常に安定に十分になされる状態 を确保でき、画像加熱定着装置にあっては画像飛び散り 現象の発生を確実に防止でき、該画像加熱定着装置、該 画像加熱定着装置を備えた画像形成装置において出力画 プ部前の導入被加熱材のプレ加熱が使用環境・使用条件 彼の英品質化を図ることができる。 2

[図面の簡単な説明]

[図2] ヒーター (加熱体) 部分の拡大模型図 [図1] 実施形態1の加黙装餌の機略構成図

[図3] ヒーターの発熱体形成面側を見せた一部切欠き

[図4] 実施形態3の加熱装置におけるヒーターの発熱 對視図

[E 🖾]

体形成面側を見せた一部切欠き斜視図

[図5] 実施形態4の加熱装置におけるヒーターの発熱 体形成面側を見せた一部切欠き斜視図

[図6] (a) · (b) · (c) はそれぞれフィルム加

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党方式の加熱装置の他の構成形態例の図

【図 7】 画像形成染質例の敷略図

【図8】 従来装置のヒーターの構成模型図 (その1)

【図9】従来装置のヒーターの構成模型図 (その2)

[符号の説明] 20 加軽存

22 基板

24 安面保護層 23 船影体

8

25 雅繁柱フィルム

26 駅10コール

28 加圧ロール (加圧部材) 徒動ロール

b 面取り斜面部

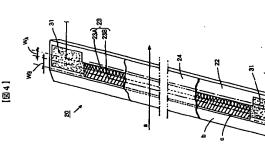
N 加戦ニップ部

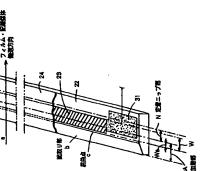
Wa 発懸体はみ出し部

P被包括在(配数数件) 40 20A プア哲戦時

[図2] 図1]

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[8][6]

